

renders obvious the above-referenced claims. The subject matter of the rejected claims is not disclosed by Hill and is non-enabling because Hill does not disclose a heat resistant binder selected from the group consisting of polyamic acids and end-modified imide oligomers. Instead, Hill discloses something quite different. In that regard, it is the intention of Hill to take an existing piece of polyimide foam, grind it into flakes and then add further polyimide foam (either the same polyimide or a different one) in fine powder form or in solution form to the flakes to be cured and formed into a final product. Hill, therefore, uses materials different from the claimed heat resistant binders.

This is demonstrated throughout the Hill disclosure. For example, Hill in Col. 2, at Lines 4 and 5 specifically states that any suitable polyimide foam material may be used as the bun material and the bonding precursor. The use of “precursor” in that context is not intended to mean a precursor to polyimide, but instead to a precursor to the final product. Thus, both the bun material and the bonding precursor are in fact polyimides. The summary of the invention portion of Hill does not provide any examples of what the bonding precursor is other than it can be any suitable polyimide foam material.

Further consideration of Hill reveals that the detailed description of preferred embodiments does not provide any description as to what the precursor might be. Example 1 confirms the earlier disclosure of Hill wherein a polyimide foam material was formed and then chopped into fine flakes. Then, “the same ground precursor powder” was added to the flakes and mixed. In other words, powder form of the polyimide used for the flakes was combined. Most of the remaining examples employ the same material for both the flakes and the precursor material.

Examples 2 and 3 are a little bit different inasmuch as they use “Skybond®” polyimide

prepolymer. Example 2 used powder and Example 3 used liquid. In both cases, they are described as prepolymers. However, the Applicants enclose a copy of product literature describing the Skybond® product family. The Skybond® used in Hill is 2601. This is clearly labeled as a foam. That can be seen in the middle of the first sheet of the enclosed Skybond® material on the left-hand side. Thus, it is clear that the entirety of Hill teaches the use of foam polyimide material. Therefore, the Applicants respectfully submit that Hill is non-enabling with respect to non-foamable heat resistant binder materials. As such, Hill is inapplicable to all of the solicited claims.

In any event, the Applicants' claims specify a heat resistant binder selected from the group consisting of polyamic acids and end-modified imide oligomers. These are inherently not foam heat resistant binders. Those skilled in the art are well aware of this fact. For example, the Applicants enclose a copy of U.S. Patent No. 5,077, 318. The Applicants invite the Examiner's attention to Col. 1, Line 15 through Col. 2, Line 2 wherein the three ways to produce polyimide foams are described. Those teachings confirm that heat resistant binders selected from the group consisting of polyamic acids and end-modified imide oligomers are not foam. They are inherently not foamable. This is, as noted above, confirmed by the teachings well known in the art.

The Applicants also enclose U.S. Patent No. 3,310,506. The Applicants invite the Examiner's attention to Col. 1, Lines 34 – 40 and Col. 5, Lines 28 – 54 that teach that producing polyimide foams from polyamic acid requires bubbling in the production process. The Applicants' claims do not recite that possibility. Instead, the claimed heat resistant binder is selected from the group consisting of polyamic acids and end-modified imide oligomers. There is nothing in that language that even hints that those materials have been subjected to bubbling. In fact, the Applicants' Specification would not support such an interpretation of that claim language.

Thus, the Applicants have demonstrated that Hill does not disclose, teach or suggest heat resistant binders. On the other hand, the Applicants have established that it is well known in the art that polyamic acid and end-modified imide oligomers are inherently not foamable heat resistant binders. The Applicants have, therefore, claimed mutually exclusive subject matter from that disclosed by Hill. The Applicants, therefore, respectfully submit that Hill can therefore not anticipate nor render obvious the claimed subject matter. Withdrawal of both rejections is respectfully requested.

In light of the foregoing, the Applicants respectfully submit that the entire application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,



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Industrial Summit Technology Co.

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SKYBOND® PRODUCTS FAMILY

THE CHOICE FOR HIGH PERFORMANCE COMPOSITE AND ADHESIVE SYSTEMS is and has always been SKYBOND®.

SKYBOND® products are a family of materials based on aromatic polyimides, one of the most thermally stable organic materials known to man. The products are solutions of polyimide precursors which, when properly cured, yield composites and adhesives with the highest thermal stability of any commercially available resin system.



COMPOSITE
700, 703, 2595, 7621, 3400



FOAM
2601



COATING
705, 3300



ADHESIVES
1888, 7621, 562, 1028



PARTS
700, 701, 703, 3400

PRODUCTS SPECIFICATIONS

PRODUCT	700	701	703	705	562	1028	1888	2595	2601	7621
Solids(%)	45-50	45-49	48-51	16-20	47-49	47-51	50-53	48-50	45-49	42-45
Viscosity (Poise)	2500-7000	200-700	3000-7000	1100-2600	1000-5000	2000-6000	5000-12000	1000-3000	150-450	1000-3000
Specific Gravity	1.15-1.18	1.05-1.10	1.15-1.18	1.05-1.08	1.12-1.15	1.08-1.11	1.13-1.14	1.10-1.13	1.05-1.07	1.13-1.15

All SKYBOND products available in 1-gallon metal containers, 5-gallon metal containers or 55-gallon drums

700 series - Highest thermal stability / MDA free

Product	700	701	2595	2601	7621
Availability	Stock	Special order	Special order	Special order	Stock
Application	Compsite	Compsite	Compsite	Foam	Compsite
Solids Content (%)	45-50	45-49	48-50	45-49	42-45
Viscosity (cps)	2500-7000	200-700	1000-3000	150-450	1000-3000
Specific Gravity (g/cc)	1.15-1.18	1.05-1.10	1.10-1.13	1.05-1.07	1.13-1.15
1gal Container	Yes	Yes	Yes	Yes	Yes
5gal Container	Yes	Yes	Yes	Yes	Yes
1drum (55gal)	Yes	Yes	Yes	Yes	Yes
Minimum order Quantity (LB)	10	250	250	250	10

703 series - BTDA / MDA based Skybond

Product	703	1888	562	1028
Availability	Stock	Special order	Special order	Special order
Application	Composite	Adhesives	Adhesives	Adhesives
Solids Content (%)	48-51	50-53	47-49	47-51
Viscosity (cps)	3000-7000	5000-12000	1000-5000	2000-6000
Specific Gravity (g/cc)	1.15-1.18	1.13-1.14	1.12-1.15	1.08-1.11
1gal Container	Yes	Yes	Yes	Yes
5gal Container	Yes	Yes	Yes	Yes
1drum (55gal)	Yes	Yes	Yes	Yes
Minimum order Quantity (LB)	10	1500	250	250

705 series - Film formable / Tougher than 700 or 703 series

Product	705
Availability	Stock
Application	Coating
Solids Content (%)	16-20
Viscosity (cps)	1100-2600
Specific Gravity (g/cc)	1.05-1.08
1gal Container	Yes
5gal Container	Yes
1drum (55gal)	Yes
Minimum order Quantity (LB)	9

*These are tentative specifications

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